

Application No. 08/354,450
Amendment dated January 7, 2004
Reply to Office Action of July 7, 2003

Amendments to the Specification:

Please replace paragraph 3 on page numbered 2 with the following amended paragraph:

J₁
It has become apparent that all meniscal tears ~~needs~~ need not be removed, but rather that they can be repaired and salvaged by suturing. The problem thus far, however, has been that the method of repair by suturing requires that both sides of the meniscus be accessible, thereby necessitating either two surgical incisions and approaches or the use of the arthroscope in lieu of one of those incisions. The arthroscope is a hollow, slender viewing rod, much like a small telescope, which can be used to view the interior of a joint. The use of an arthroscope requires a very small incision and it is possible to perform some limited types of surgery entirely with the arthroscope alone. However, this has not proven to be useful for meniscal repair.

Please replace the paragraph bridging pages numbered 2 and 3 with the following amended paragraph:

J₂
At the present time, meniscal repair is performed in the following manner:
An arthroscope is introduced through a small opening from the front of the knee joint (anteriorly) and the torn meniscus is visualized. A second small opening is also made anteriorly and a feeler device is introduced to probe the tear. These tears all occur toward the back of the knee joint (posteriorly). This is most unfortunate since this is the location of the great blood vessels and nerves of the leg. In order to repair the meniscus, therefore, one must, with significant risk, make an ample incision and surgical approach so as to expose the back of the knee joint in the region of the meniscus to be repaired. But even then there is precious little working room, and since the needles used to sew the meniscus back in place must be quite long, as they can only be passed from front to back as otherwise there would be no reliable way to tie the ends within the joint, they may cause innocent and vital structures to be either penetrated or entrapped and

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car
J2 subsequently damaged. Hollow metal guards have been used to help direct the paths of the needles used to limit the possibility of such damage.

Please replace the 2nd full paragraph on page numbered 3 with the following amended paragraph:

J3 ~~Rivet-like~~ Rivet-like tabs, sometimes referred to having a penetration head, projecting flexible members and a wide rear portion have been used for attaching carpeting to a main frame of an automobile. Such ~~device~~ devices are typically hammered directly through the carpet into a hole pre-formed in the car body. Such devices are relatively large and ~~had~~ have no application in a surgical procedure.

Please replace the 3rd full paragraph on page numbered 3 with the following amended paragraph:

J4 The present invention comprises a small ~~rivet-like~~ rivet-like member in the form of a shaft having flexible projection fins extending axially from the shaft, such projections preventing withdrawal of the rivet. A penetration head is located ~~at~~ the front of the shaft, and the rear of the shaft has a widened portion, in the form of a disc and means for removably engaging a driver member.

Please replace the 1st full paragraph on page numbered 4 with the following amended paragraph:

J5 The present invention is safer than prior devices because it does not require a second incision, that incision usually being quite major, and since it can be deployed through the small portal already present to perform the diagnostic portion of the arthroscopy, it is more efficient than prior art. Accordingly, it does not threaten the neurovascular structures which would be interposed between the open incision and the inside of the knee joint. Because of the ability of escape the extra incision, there is decreased chance of infection and decreased tissue damage. Because this device can be utilized without additional surgery, it

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is more efficient than the prior art. Also, because it is specifically designed to bring meniscal fragments back together, and the prior art simply utilizes sutures, it is also more effective than prior systems.

Please replace the paragraph bridging pages numbered 5 and 6 with the following amended paragraph:

34
Referring to the Figures 1-4, the preferred embodiment of the present invention is shown. The rivet 10 consists of a tubular shaft 12 having a cone shaped penetration head at one end. A series of axial projections 16 spaced extend from the shaft, spaced apart from one another. The projections 16 are slightly sloped away from the projection head 14. The projections 16 extend only about one half the length of the shaft 12. A widened portion, in the form of a wide circular disc 18, is formed at the rear end 20 of shaft 12. The disc 18 is circular in shape and is beveled around its circumference 22.

[Please replace the 1st full paragraph on page numbered 6 with the following amended paragraph:]

The rear end 20 of the shaft 12 has a depression 24 in the form of a sphere. The depression 24 is designed to engage a complementary projection 32 at the end of drive-driver 30. The projection 32 has a slightly smaller diameter than the depression 24 in the rear 20 of the rivet 10. The projection 32 of the driver 30 fits within the depression 24 in the same manner that toy pop beads engage one another.

Please replace the 1st full paragraph on page numbered 7 with the following amended paragraph:

37
The driver 130 associated with rivet 100 comprises a handle 131 having a shaft 132 terminating in a sharp tip 133. The forward face 135 of the handle 131 at the juncture of the shaft 132 and the handle 131 is flat so as to conform to the flat shape of the disc 118, and has a diameter slightly larger than the diameter of

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ck
J1
the disc 118. The diameter of the shaft 132 is slightly smaller than the inside diameter of the passageway 124.

Please replace the paragraph bridging pages numbered 7 and 8 with the following amended paragraph:

J8
The shaft 132 of the driver 130 with the rivet 100 in place is then pushed through the meniscus M until the tear T is compressed. The force on the face 135 of the driver 130 causes the disc 118 to deform so as to conform to the surface of the meniscus, as shown in Figures 6 and 7. The beveled edges 122 of the disc 118 and the projecting fins 116 prevent dislodging the rivet 100 from the meniscus M. Once the rivet 100 is in the meniscus M, the driver 130 can easily be withdrawn and another rivet 100 placed on the driver and the process repeated.

Please replace the 2nd full paragraph on page numbered 3 with the following amended paragraph:

J9
The projection ~~432~~ 32 of the driver 30 is slightly smaller than approximately 2mm in diameter so as to fit within in the depression 24 in the rear of the rivet of about 2mm. The length of the handle 30 is about 500mm.

Please replace the 4th full paragraph on page numbered 8 with the following amended paragraph:

J10
Referring to Figures 9 and 10, alternative embodiments of the present invention is ~~are~~ shown, in which a biodegradable screw is used in place of the rivet. ~~Which Although~~ screws have been used before for such an application, they have been metal screws that were not biodegradable or absorbable.

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Please replace the 6th full paragraph on page numbered 3 with the following amended paragraph:

511 In ~~figure~~ Figure 10, a rivet in the form of a sheet metal screw 300 is shown. Again the screw is driven by an allen wrench opening 302 in the head 304 and the tear in the meniscus compressed between the threads of the screw 300 and the head 304 of the screw 300.